JOURNAL OF HEALTH SCIENCES
ACCEPTED ARTICLE
Submitted: 2 July 2017
Accepted: 2 September 2017
DOI: https://doi.org/10.17532/jhsci.2017.444

Running title: Laparoscopic Surgery of Ampullary Carcinoma

Minimally Invasive Surgical Treatment of Carcinoma of the Papilla of Vater - Case Report

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ABSTRACT

Ampullary cancer is a rare neoplasm of pancreaticobiliary tract. The most ampullary neoplasms require surgical resection. Cephalic pancreaticoduodenectomy has been performed laparoscopically in a high volume institutions around the world. In this paper, we present a patient aged 63 years, in which the detailed diagnostic evaluation of painless jaundice, including biopsy of change on the papilla of Vater by proximal endoscopy with histology findings, the diagnosis of adenocarcinoma of the papilla of Vater was made. Laparoscopic surgery of cephalic pancreatoduodenectomy with appropriate lymphadenectomy was successfully carred out in the treatment of ampullary cancinoma in this case. To our knowledge, this complicated and technically challenging surgical procedure is the first operation of this kind in our country and the region.

Keywords: ampullary neoplasms, surgical treatment

INTRODUCTION

Ampullary carcinoma is a rare malignant tumor originating in the papilla of Vater in the wall of the duodenum in which are located ends of the common bile duct and a large pancreatic duct. The most common histopathological types of ampullary neoplasms are intestinal type (47%), pancreatic biliary (24%) and poorly differentiated adenocarcinomas (13%) (1). Although rare, with incidence of 5 to 1,000,000, this cancer causes more than 20% of the tumor causing biliary obstruction (2). The diagnosis is established on the basis of endoscopic, histopathological and radiological evaluation.

Treatment depends on the tumor size and extent of the disease and is in particular: the endoscopic ampullectomy in a case of small tumor and small initial lesion, the surgical treatment of nonmetastatic disease and oncological treatment of metastatic disease and locally advanced tumor (3,4). The only treatment of ampullary cancer that provides proven benefit for patients is a complete surgery tumor resection with negative margins (R0 resection), either as laparoscopic or classical cephalic pancreatoduodenectomy (5). The laparoscopic methods are implemented in the "high volume" centers, which have the ability to develop technically extremely demanding minimally invasive surgery cephalic pancreatoduodenectomy. Prognosis and survival depends on the correctness of the resection procedure and radical lymphadenectomy, histological type and disease stage of the disease (TNM) (6).

CASE REPORT

The patient aged 63 years with painless jaundice as the first sign of disease, was admitted to the Clinic for Gastroenterohepatology in early January 2017. The laboratory test results showed: elevated bilirubin markedly (158 mmol/L), blood count, serum proteins and minerals were in the reference values, as well as the values of tumor markers (CEA, AFP, CA 19-9, and CA 125-5). The proximal endoscopy with endoscopic retrograde cholangiopancreatography

(ERCP) was done and verified the change in the papilla of Vater. Biopsy sample was taken for pathologic evaluation, and in the same procedure two biliary stents were placed. Within five days of the stents placement the bilirubin level in the blood was decreased to the norman value. The pathological lesion (29x16 mm) was verified by endoscopic ultrasonography in the projection of the pancreas head, not separated from the duodenum. Histopathologic findings of biopsy samples speak for adenocarcinoma of the papilla of Vater. Computed tomography (CT) scan of abdomen and pelvis confirmed a periampullary mass (Figure 1), with no metastatic lesions and infiltration of surrounding vascular structures.

Oncology medical council indicated surgical treatment, and on February 8th, 2017, the patient was admitted at Clinic for General and Abdominal Surgery. Surgical laparoscopic resection with pancreaticoduodenectomy was done under general anesthesia.

The laparoscopic surgery was performed using five ports. At 10 mm umbilical port endocamera was introduced. One port is placed left paraumbilically in order to introduce a 12 mm EndoGIA stapler. Five mm ports were placed right paraumbilical and mutually hypochondral. After the presentation of the superior mesenteric arcades and the formation of retropancreatic cleavage the pancreas was “curbed” with a rubber band. Then the hepatic artery appeared coming out from the celiac trunk without anatomical variations. Kocher manoeuvre was performed. Jejunum was liberated from Treitz's ligament and resected approximately 20 cm distal from it using endostapler. The stomach was resected in the antral region with endostapler. The pancreas was cut with EndoHarmonic instrument, followed by dissection of the pancreas head from mesenterial radix and portal vein. Ductus holedochus was prepared to the level of ductus hepaticus communis, where it was cut. Lymphadenectomy of hepatoduodenal ligament and the celiac trunk was carried out (Figure 2a) and surgically resected organs (Figure 2b) was extracted on 5 centimeters of infraumbilical laparotomy (Figure 3).

After placing a pancreatic stent, a one-layer terminolatetral pancreaticojejunostomy was made with Prolene 3/0 (Figure 4a).

A one-layer terminolateral hepaticojejunostomy was formed with "V lock" distally at the same part of jejunum (Figure 4b) that was conducted retrocolically, fixed to the transverse mesocolon, and the antecolic gastroenteroanastomosis was made using endostapler.
Subhepatic space was drained. The whole operation lasted six hours. On the third postoperative day the patient was put in vertical position, and the fourth day converted to oral feeding. She was discharged home on the ninth postoperative day. The definitive histopathological examination pointed to Adenocarcinoma grade II of papilla of Vater (intestinal type), pT2N1R0 (13 lymph nodes, one positive), and the adjuvant oncology treatment was indicated.

DISCUSSION

Cancers of periampullary region are the predominant cause of malignant jaundice. The real challenge is to diagnose the disease in its early stages. In our Clinic, in addition to other surgical procedures on the pancreas, an average of five cephalic pancreatoduodenectomy are performed per month, which places our institution amongst "high volume" centers for pancreatic surgery (7). Classical Whipple's operation or "pylorus preserving" cephalic pancreatoduodenectomy represents standardized operation for the treatment of malignant and partly of benign pathologies of the periampullary region and head of the pancreas. Generally accepted upper mesocolic radical lymphadenectomy represents an integral part of the operation, due to the clear oncological principles and benefits for the patients (8).
In this paper we present the case of a patient with carcinoma of the papilla of Vater, who underwent laparoscopic cephalic pancreatoduodenectomy with adequate lymphadenectomy and intracorporal anastomoses, for the first time in our country and the wider region. The fact that the laparoscopic resection of the pancreatic head is performed exclusively in the highly

specialized and high-frequency centers worldwide indicates the level of complexity and technical demands required for such procedures (9). The postoperative course was apparently different from the open operating procedures, namely by the speed of patient's recovery due to minimal trauma, by the speed of verticalization, and the time needed to establishment of normal intestinal passage and conversion to oral feeding, as well as by the reduced use of analgesics (10). A sufficient volume of lymphadenectomy and surgical radicalism can be achieved by laparoscopic access, as evidenced by the pathological findings of the preparation (number of lymph nodes and adequate resection margine). Blood loss was significantly lower than with conventional methods (11,12). The duration of the operation is slightly longer with laparoscopic procedures compared to the classical method and the number of postoperative days is shorter in laparoscopic compared to conventional surgery (13). The percentage of postoperative complications was significantly reduced, due to non-existence of surgical would infection (9). Minimally invasive approach is reserved for well-differentiated cases, with a clear picture of the surrounding infiltrations and anatomical variations, because the care and resection of infiltrating blood vessels are extremely demanding. Therefore, advanced processes and processes infiltrating hepatic and splanchnic venous vessels are still reserved for the open methods (8).

CONCLUSION

Classical Whipple's operation is one of the most demanding surgical procedures in the abdominal surgery and its laparoscopic act is perhaps the biggest challenge in digestive surgery. Minimally invasive pancreatic surgery presents oncologically fair, and for the patients comfortable and safe method of treating malignancies of periampullary and cephalic pancreatic region.

Competing Interests

Authors declare no conflict of interest related to this study.

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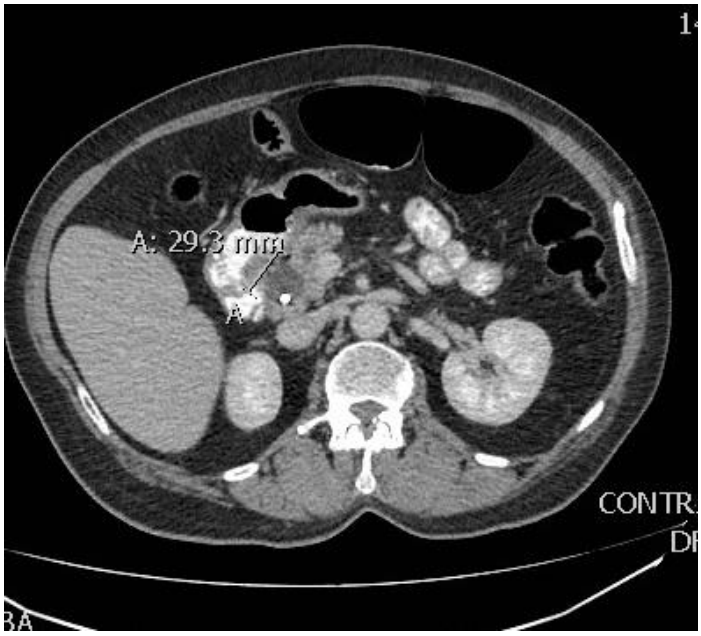

Figure 1. Periampullary lesion on CT scan of abdomen

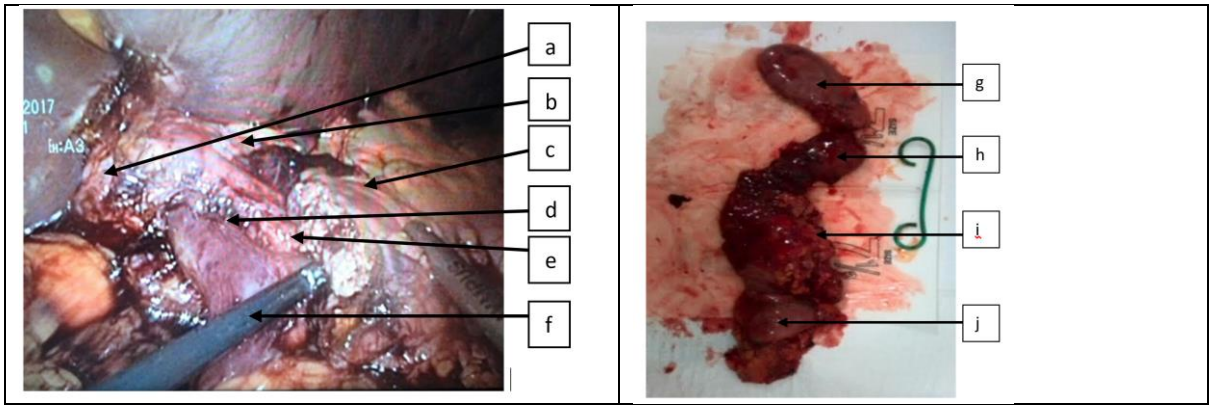

Figure 2. (A) Surgical field after resection: a) common hepatic duct; b) common hepatic artery; c) body of pancreas; d) portal vein; e) lienal vein; f) superior mesenteric vein. **(B)** Surgical resected organs: g) gall bladder; h) choledoch duct; i) head of pancreas; j) duodenum

Figure 3. Abdominal wall after laparoscopic pancreaticoduodenectomy

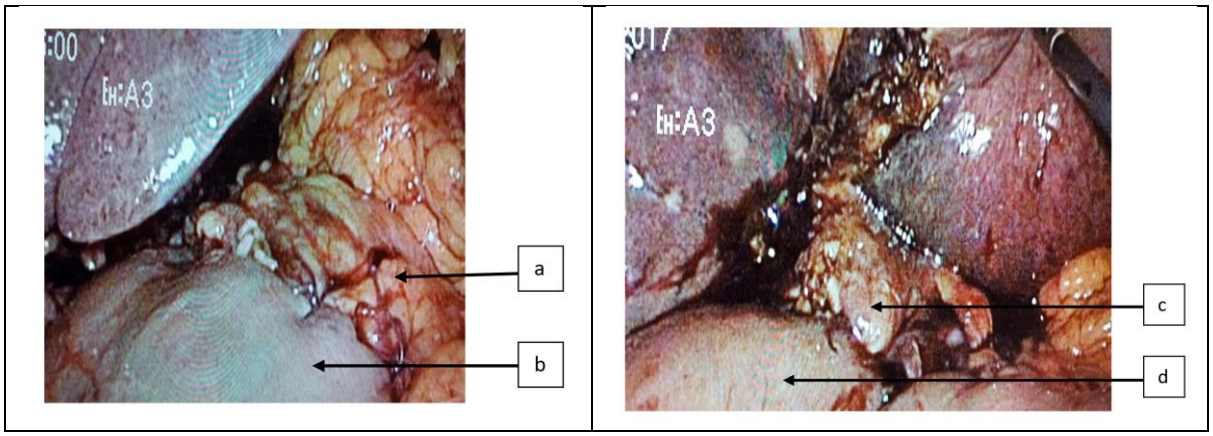

Figure 4. (A) Terminolateral pancreaticojejunostomy a) pancreas; b) jejunum. **(B)** Terminolateral hepaticojejunostomy: c) common hepatic duct; d) jejunum